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SCOTT TURNER, DIRECTOR

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CONSERVATION OF NATURAL GAS IN RELATION TO SOME RECENT DEVELOPMENTS

BY

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CONSERVATION OF NATURAL GAS IN RELATION TO SOME RECENT DEVELOPMENTS[1]

By Scott Turner, Director,
United States Bureau of Mines

To be successful, human exertion employed for the creation of value requires power and heat; the ability to produce concentrated power in great quantities has resulted in the relatively recent industrial development that is so profoundly affecting the world. In our commercial history, we have advanced through several stages in the selection of the most suitable fuels, continuously striving to increase the flexibility and range of energy-transmission.

The easy distribution of light, power and heat is the leading factor in the decentralization of industry which promises to correct some of the serious evils that have followed in the footsteps of our commercial development. The distribution of fuel in quantity in so convenient a form and with such an attractive reliability-factor as can be had with gas, meets the modern conception of efficient service.

Natural gas has been used in this country for more than a century, but recently it has attained a prominence far in excess of anything known in its earlier history. We may consider that we are now getting into our real stride in the utilization of our natural-gas resources.

In a country like the United States, wherein we are accustomed to mammoth achievements, we may be inclined to accept casually the noteworthy technical and economic advances which have resulted in the expansion of natural-gas distribution. About three years ago, the transmission of natural gas a distance of more than 250 miles from its source was first accomplished, and this was really a noteworthy engineering feat. Today, this useful commodity is being transported twice that distance, and lines are being laid which will carry gas more than 900 miles from the points of occurrence. Let us not take such outstanding improvements too much as a matter of course; the industry should be congratulated on its long steps forward.

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1 - Address delivered at the meeting of the American Gas Association, Atlantic City, N. J., October 14, 1930. The Bureau of Mines will welcome reprinting of this paper, provided the following footnote acknowledgment is used: "Reprinted from U. S. Bureau of Mines Information Circular 6392."

Improvements in mechanical devices used in pipe-line construction have contributed to wider distribution. Ditching machines have replaced pick and shovel methods; tractors and other machines especially designed for the work are used in handling pipe; automatic field-welding processes have been developed; improvements in pipe-manufacture and quality of material have increased our ability to transport gas under high pressures. These are some of the engineering contributions.

On the economic side, company-surveys have indicated that assured supplies are available to meet certain new demands; with this knowledge as a background, the industry has received the needed financial support. By creating an increased demand for steel products, the construction of these pipe-lines has in itself been a factor of social and economic importance.

Recent developments are largely associated with three principal gas-producing areas: The Monroe-Richland region in Louisiana, serving the Southeastern portion of the country; the territory including the Texas and Oklahoma Panhandles, Southwestern Kansas and adjacent areas which may be combined to serve the Central United States; and the California fields, furnishing gas for distribution on the Pacific Coast. While developments in the Rocky Mountain region indicate the presence of major supplies of gas, as yet these have not been brought to anything like complete development. From the region surrounding the Texas Panhandle, lines are now being built to serve Indianapolis, Chicago, St. Paul, Minneapolis, and numerous communities in the intervening territory.

Upon the completion of these new lines, and when connections have been made with some of the older systems, nation-wide distribution of natural gas will be well within the bounds of possibility, and the quantity of potential energy that can be transmitted by such pipe-line systems may only be expressed in figures so large as to remind one of astronomical computations.

Such extension of natural-gas distribution, supplementing our great electrical distributing systems at points where it is most needed, will lead to the establishment of many new social relationships. The dependence of numerous communities for fuel upon a single producing region will focus attention upon the conditions of production and distribution in that region. Communities served by natural gas will thus become interested in the efficient production and utilization of this fuel, and such stimulation of interest in the elimination of waste may eventually have nation-wide effects.

A realization of these facts, and the appreciation of the increasing public interest in natural gas, led your Association to express itself definitely on the subject of conservation. A resolution adopted at the Natural Gas Convention at New Orleans in May of this year recommended that Natural-gas conservation be made the subject of intensive survey, and suggested that the United States Bureau of Mines be requested to assist in the study. Pursuant to this resolution, a series of conferences was held between representatives of the two organizations, and the Bureau undertook to review the literature dealing with elimination of waste in production, distribution, and utilization of natural gas, in order that your committee might have information enabling it to present a plan for further study to you at this October meeting.

By its Organic Act, and through subsequent legislation, the Bureau of Mines has been designated by the Congress to conduct scientific and technologic investigations with a view to conserving mineral resources through the prevention of waste, and to inquire into the economic conditions affecting the mineral industries. You should bear in mind the fact that the Bureau of Mines has no mandatory powers. It has no duty of enforcement. Our only purpose is to be helpful. In us you see an organization created and conducted with the sole aim of assisting the public and the mineral industries of this country in solving such technical and economic problems as may confront them. It is a governmental organization equipped to study problems of mineral-resource-conservation from a point of view which insures consideration of the interrelationships of the fuel-producing and fuel-consuming industries. The Bureau of Mines neither establishes nor enforces any rules or regulations. It is thus an organization available to assist such an association as your own. We are pleased that you have recognized the value and need of more rigid and efficient conservation of natural resources. If you wish it, we will assist you in discovering and making available the facts regarding waste of gas, and in furthering the conservation of this important national resource.

It is easier to indicate waste than to eliminate it. You know there is waste in the production and the consumption of natural gas, and that there may be avoidable waste in its production, distribution and usage. The extent and character of present waste should be ascertained, and some comparisons should then be made with previous conditions. It is well-known that your industry has not failed to consider this problem in the past, and it is a matter of common knowledge that the producers and distributors of natural gas have already made much progress in solving their individual problems. The present need, and I understand this is the opinion of your committee, is to find out what can be done by the industry as a whole, in securing the maximum of usefulness from the natural gas produced in the United States.

The production and utilization of natural gas are so closely associated with the economic well-being of other major mineral industries, that the problem of natural-gas conservation cannot well be considered solely within the limits of this single industry. Before considering natural gas as a fuel, it must be thought of as a physical agent responsible to an important degree for moving crude petroleum to the surface. In this it performs a valuable service. Between 60 and 70 per cent of the natural gas actually utilized is produced in conjunction with the output of crude petroleum, and the need for oil is thus an important factor in determining the quantity of gas brought to the surface. One of the main factors in determining the production-rate of natural gas is therefore under the control of the oil industry, which is associated with, but somewhat apart from, the natural-gas industry. The waste which occurs between the production of natural gas, and its utilization, results in part from this fact that one industry largely determines the rate and the amount of production, while another industry has the job of seeing to it that the produced gas is properly utilized.

Because of the natural gasoline contained within it, there may be a demand for natural gas, entirely apart from its use as a propulsive agent in the production of crude petroleum, and aside from its fuel-utility. Natural-gasoline plants in various oil fields have assisted conservation by the collection of gas from scattered wells, and by making considerable volumes of residual gas available at central points. The carbon-black industry is interested in natural gas, and each one of us is personally interested in greater mileage from his automobile tires resulting from the use of carbon-black in tire-manufacture. Fuel-consumers are bound to be interested in this natural energy-source, both as to the supply and in regard to future uses. The wide development of small power-units within the reach of gas-distributing systems will add to our millions of internal combustion engines. It goes without saying that the producers of other industrial and domestic fuels, whether they be solid, liquid, or gaseous, should not be disregarded in any consideration of the conservation or utilization of natural gas.

Although we may be struck with the extent of recent accomplishment, we should still consider that the natural-gas industry is in its youth; your Association has expressed the desire that its future may benefit from all that may be learned from the past. An industry built upon sound investigation and interpretation of fact, should surely prosper.

During the past few years, our Bureau has worked with your Association in the solution of several problems, among which were the measurement of natural gas by large-volume meters, determination of leakage from high-pressure natural-gas transmission-lines, flow of gas through pipe-lines, and gauging gas-well capacities. We have always found yours to be an organization desirous of taking full advantage of scientific data. Because of these pleasant and profitable contacts, I welcome this opportunity of coming to your annual convention, and of again suggesting that the United States Bureau of Mines will always be glad to work with the American Gas Association. This is the message I am here to deliver.